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November 13, 2023

The Honorable Laurie J. Miller  
Hennepin County Government Center  
300 South 6<sup>th</sup> Street  
Minneapolis, MN 55487

**VIA E-FILEING AND E-MAIL**

Re: City of Long Lake v. City of Orono  
Court File No.: 27-CV-23-9758

Dear Judge Miller:

I felt this letter was necessary in light of the arguments made last Wednesday. Specifically, with respect to construction next to Fire Station 2, Mr. Reuvers indicated that there were no plans, and that plans would be shared with Long Lake once they were in place. On Friday, November 10, 2023, Orono published its Agenda Item for its Council meeting this evening, including twenty-one pages of design plans that are dated October 2 and 3, 2023. (Agenda with enclosures are attached and available at:

[https://oronomn.granicus.com/MetaViewer.php?view\\_id=1&event\\_id=853&meta\\_id=54325](https://oronomn.granicus.com/MetaViewer.php?view_id=1&event_id=853&meta_id=54325) ).

Item two of the Agenda includes the following Statement: “Oertel [Architects] has completed a study for both modification to the existing public works facility **and the option of adding a 2-bay addition to the Existing Navarre Station.**” (Emphasis added). Attached to the Agenda are a memorandum from Oertel Architects addressing the “Addition of two bays at the existing Navarre site.” The Oertel memo also states:

Initial review of the site topography raises some concerns on whether this [a pre-engineered building] is the best solution moving forward. The building will require significant soil retainage on the north side of the building. It is the design team’s opinion that a conventional masonry/precast and steel joist construction method might make more fiscal sense.

Additionally, a Structural Schematic Design Narrative from Design Tree Engineering and Land Surveying was attached to the agenda addressing, among other things, “developing an apparatus by addition to the existing Navarre Fire Department in Orono, MN.”

Contrary to the representations at the hearing, Orono has been actively working with architects and design engineers on plans for a structure next to Station 2, and has not sought the consent of,

or even shared the plans with, Long Lake. In fact, at a “Coffee with the Mayor” event at 9:00 a.m. on the date of the hearing, Mayor Walsh stated at 40:13:

So it is very well thought out for sure. We’ve got it all kind of nailed down. We’re just uh. There is someone doing a little blocking and tackling in front of us right now but that doesn’t stop us we’ve already kinda moving forward on Monday we’re going to approve the design for the architects to finalize the designs for what we have to fix over at the Public Works Building and then have that done so we can bid it and then fix it and then start moving fire trucks and personnel into there and for then the design for the addition that we are going to add over in Navarre as well.

Earlier in the same meeting, Mayor Walsh stated the following at 32:28:

The other part is building this addition over in Navarre, which is the land that we own. So we feel we should be able to build on our own land without getting approval from anybody.

See <https://www.youtube.com/watch?v=GKCCwYCHnTA>

Given that the only access to the planned addition is directly in front of the bay doors to Fire Station 2 (see Diagram A-102, dated September 22, 2023, to Oertel Report), and Long Lake has not been consulted on any building activities, Long Lake does not consent to the proposed plans.

Respectfully,

A handwritten signature in blue ink, appearing to read "Ch. Yetka", with a horizontal line extending to the right.

Christopher H. Yetka, for  
Larkin Hoffman Daly & Lindgren Ltd.

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## AGENDA ITEM



Item No.: 27

Date: November 13, 2023

**Item Description:** Temporary Fire Facility (23-044)- Design and Construction Document preparation Authorization

**Presenter:** Adam T. Edwards, P.E.  
City Engineer

**Agenda Section:** City Engineer Report

1. **Purpose.** The purpose of this action item is gain council approval for the attached contract for Architectural services.

2. **Background.** In 2022 the city completes a facility future use study for the existing/old public works facility. The study looked at use of the facility for either a fire station or a recreation facility. As part of the Fire Needs Assessment staff analyzed potential facility needs to support the future fire department using the existing fire stations. Resolution 7375 directed staff to solicit design proposals for remodeling the old public works facility for potential use as a fire station and a facility study on the existing stations. Staff solicited a proposal for Oertel Architects, the design firm for our new public works facility and author of the future facility study. Current litigation may hamper access to existing facilities to complete the studies. At the July 24<sup>th</sup>, 2023 Meeting Council directed staff to engage with Oertel Architects to provide architectural services for a design proposal to remodel the old public works as a temporary fire station. At the August 28th meeting the council approved the contract and authorized the completion of the schematic design phase of the projects. Since that time Oertel has completed a study for both modification to the existing public works facility and the option of adding a 2-bay addition to the Existing Navarre Station.

3. **Costs.**

a. **Design.** Based on the contract with Oertel the following is the breakdown in design costs. Actual costs incurred are based on the design effort required using hourly rates.

Work	Cost (Not to exceed)
Schematic Design Phase	\$ 35,414.40
Design Development Phase	\$ 82,633.60
Construction Documents	\$ 106,243.20
Procurement Phase	\$ 59,024.00
Construction Phase	\$ 44,268.00
Total Cost of architect services if project proceeds to a full \$3.3M remodel	\$ 295,120.00

b. **Construction.** The initial Opinion of Probable Costs from the schematic design phase are listed below. More refined cost estimates will be developed during the design development phase.

Description of Work	Cost Estimate	Comment
Remodel of Old PW Facility	\$ 750,000	This is a very conservative estimate. Mechanical evaluation of existing systems will likely result in a lower estimated cost.
Construction of two bay Addition at Navarre Station	\$ 750,000	This cost is based on per square foot estimates from recent similar projects.
Total	\$ 1,500,000	

4. **Funding.** The Facilities bonding included \$3,000,000 for potential fire facilities.

Prepared By:

*AE*

Reviewed By: *NJD*

Approved By:

*AE*

5. **Staff Recommendation.** I recommend authorization to proceed to the next levels of the design which is the design development and construction document phases.

**COUNCIL ACTION REQUESTED**

Move to authorize work associated the design development and construction document phases of the design process.

**Exhibits**

A. Preliminary Analysis Report by Oertel



1795 St. Clair Avenue  
St. Paul, MN 55105  
(651) 696-5186  
www.oertelarchitects.com

## City of Orono Fire Department

Date: October 3, 2023  
OA Project No.: 22-10  
To: Adam Edwards  
CC: James Van Eyll  
RE: Preliminary Analysis

### Background

The City is pursuing two projects related to the transition from a shared agreement with Long Lake to a standalone fire department. The two projects are:

1. Renovation of the existing Public Works building
2. Addition of two apparatus bays at the existing Navarre site

### Preliminary Goals/Analysis (Architectural)

#### Renovation:

The goal of this analysis is to identify the baseline requirements for converting the existing building for short-term use by the Fire Department. As such, the architectural scope will be limited to the work required for certification by the state while providing a safe and healthy working environment for staff. The architectural scope consists mainly of:

1. Demolition and finish work as required to accommodate new uses.
2. Replacement of overhead doors
3. Replacement of doors and hardware as required to meet current accessibility requirements
4. Patch and repair of exterior sealants and caulking

The preliminary floor plan concept (attached) also necessitates minor interior new construction improvements such as new walls, etc. In addition, demolition and construction will be required to facilitate mechanical/electrical/structural scope as noted within this report.

#### Addition:

The City seeks to build a small addition to the existing Navarre Fire Station. This addition will house two apparatus bays and other incidental support functions. The preliminary thought was to build a pre-engineered building. Initial review of the site topography raises some concerns on whether this is the best solution for moving forward. The building will require significant soil retainage on the north side of the building. It is the design team's opinion that a conventional masonry/precast and steel joist construction method might make more fiscal sense. This will be further reviewed and analyzed moving forward.

The new area can be built as either a separate building or as an addition. If it is constructed as a separate building, we need a minimum of 10' between the existing and new building to avoid any rated walls, doors, etc. We are currently showing 20' between the new and existing buildings, with the thought



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that they could infill that 20' in the future, to attach the new and existing buildings, allowing for another apparatus bay (in lieu of a 10' wide addition).

If we add directly onto the existing building, assuming it is Type II-B construction, we don't have any requirements which would impact the existing or new building, as it would be a total of about 10,000 square feet which is under the allowable area for a type II-B building in either the B or S-1 categories. A new bearing wall could be constructed on the exterior, north side of the existing building if there is a concern about not impacting the existing building during construction. At that point it would have an incidental impact including utility service and the connection at the roof. There are a few clerestory windows on the existing north side of the building, but they could remain exactly as they are until the building design is finalized.

### **Conclusion**

Please see attached for a more detailed analysis per engineering discipline. We are currently compiling pricing information. Given the indeterminate and selective scope, we will need to work within a pricing range prior to obtaining actual bid numbers. Overall, I believe that the City can achieve its long-term and short-term goals within a reasonable timeframe and budget. Please let me know if you have any preliminary questions.

Thank You,

Thomas Stromsodt, AIA

**Structural Schematic Design Narrative**  
**DTE Project No. 096 23 003**

**1.1 INTRODUCTION**

- A. Design Tree Engineering is assisting the City of Orono in developing plans for the reuse of the existing Orono Public Works building to transition to a fire station as well as developing an apparatus bay addition to the existing Navarre Fire Department in Orono, MN.

**1.2 GENERAL BUILDING DESCRIPTION**

- A. The existing Orono Public Works building is located adjacent to the Orono City Administration buildings in Orono, MN. Refer to the Architectural drawings for more information about the floor plan and the proposed specific locations for the office areas, vehicle apparatus bays and wash bay.

**1.3 GENERAL SYSTEMS DESCRIPTION**

**A. Building Systems**

- 1. The existing building consists of the following.
  - a. Single story gabled pre-engineered metal building clear spanning a 79'X228' space. Pre-engineered bent spacing varies from 20' to 25' o.c. This area is currently used for vehicle storage. Existing drawings indicate that the existing building was designed for self-weight of the structure, weight of mechanical systems shown on the structural drawings and an additional 3psf collateral dead load. The design snow load was indicated in the construction documents to be 40psf plus drifting.
  - b. Two story gabled roof building spanning a 32'X61'-4" on the southeast side of the building. The roof of this building is a pre-engineered building structure. There is an elevated floor below this roof framed with 12" precast spanning the 32' direction of the building. The load rating on this mezzanine is stated on the structural drawings as 250psf live load capacity. This area below this mezzanine is currently used for administrative offices. Load rating for the roof is as indicated above.
  - c. Single story flat roof spanning a 23'-4"X103'-4" building area with 8" precast planks spanning east to west and bearing on masonry walls located on the east side of the building. This area is currently used for storage and for work areas. Load rating for the roof is as indicated above.
  - d. Single story gabled roof building clear spanning a 50'-4"X62'-8" area with a pre-engineered metal building on the northeast side of the building. This area is currently used as a service bay with an overhead crane. Load rating for the roof is as indicated above. Crane capacity was not indicated on the existing drawings

**1.4 CODES AND STANDARDS**

- A. 2020 Minnesota Conservation Code

## DTE MECHANICAL AND PLUMBING SCHEMATIC DESIGN NARRATIVE

Orono Public Works – Fire Station Transition & Navarre Fire Station Apparatus Bays

- B. 2020 Minnesota Building Code.
- C. ASCE 7-16.

### 1.5 STRUCTURAL REQUIREMENTS

- A. The Minnesota Conservation Code, chapter 10, addresses structural requirements for an existing building which will undergo a change of occupancy. Chapter 1006 discusses the following structural items.
  - 1. 1006.2 – Snow and Wind Loads. Where a change of occupancy results in a structure being assigned to a higher risk category the structure shall satisfy the requirement of section 1608 and 1609 of the International Building Code. Where the area of the new occupancy is less than 10% of the building area, The cumulative effect of occupancy changes over time shall be considered.
  - 2. 1006.3 – Seismic Loads. Where a change of occupancy results in a building being assigned to a higher risk category, the building shall satisfy the requirements of section 1613 of the international Building Code for the new risk category using full seismic forces.
- B. In this building, the structure will have a change in risk category from a category II to category IV. The building, unless only 10% occupied by the new occupancy, will need to comply with current building code requirements. Existing vs proposed loadings are summarized below.
  - a. Snow Loads
    - 1) Original Design Documents – 40psf + Drifting
    - 2) New Snow Loading –
      - a) Ground snow: 50psf
      - b)  $C_e = 1.0$
      - c)  $C_t = 1.0$
      - d)  $I = 1.2$
      - e)  $C_s = .79$
      - f) Flat Roof Snow Load – 33.3psf
  - b. Wind Load
    - 1) Original Design Wind
      - a) Basic Wind Speed – 80MPH
      - b) Exposure – B
        - (1) Windward Wall = +9.05
        - (2) Leeward Wall = -5.65
        - (3) Windward Roof = - 10.2 / +3.4
        - (4) Leeward Roof = -7.92
    - 2) New Wind Loading
      - a) Basic Wind Speed – 122MPH
      - b) Exposure – B
        - (1) Windward Wall = +8.51
        - (2) Leeward Wall = -5.87
        - (3) Windward Roof = - 8.23 / -2.1
        - (4) Leeward Roof = -3.52





## DTE MECHANICAL AND PLUMBING SCHEMATIC DESIGN NARRATIVE

Orono Public Works – Fire Station Transition & Navarre Fire Station Apparatus Bays

### 1.6 Conclusions:

- A. By comparing snow and wind loading from the original design, governed by the 1988 Uniform Building Code, to that which would be required for a change of occupancy as a category IV structure governed by the 2016 International Building Code, it does appear that the structure demand for the building will slightly decrease. This leads us to the conclusion that the building may work with little structural change to the facility.
- B. To confirm item A, a structural model of a single bent was analyzed by our office. This model did indeed show that even with a change of use, the existing structure may be capable of supporting current design loads.
- C. In the construction document phase, our office will measure other bents and framing to confirm that all bents can safely support the load resulting from the change in use. If this analysis does so some areas of concern, we anticipate that any structural changes required would be minor.
- D. Care should be taken to not increase the load on the structure above what is currently in place.

END OF STRUCTURAL SD NARRATIVE



**Mechanical Systems Schematic Design Narrative**  
**DTE Project No. 096 23 003**

**PART 1 SYSTEMS DESCRIPTION / GENERAL DESIGN INTENT**

**1.1 INTRODUCTION**

- A. Design Tree Engineering is assisting the City of Orono in developing plans for the transition or temporary use of the existing Orono Public Works building as a fire station as well as developing an apparatus bay addition to the existing Navarre Fire Department in Orono, MN.
- B. The existing public works building would provide apparatus bay spaces for as many as six engine, heavy rescue or tanker trucks, three command or medical response vehicles and storage for trailers and boats. Additionally, the existing spaces would be used for offices, locker rooms, fitness room, turnout gear, decontamination, SCBA equipment, storage and a multi-purpose / training room. The existing wash bay at the NE corner of the building would remain in-place.
- C. The new apparatus bay at the Navarre Fire Station would provide two side-by-side roughly 80-ft length by 20-ft width apparatus bays for storage of up to four engine, heavy rescue or tanker trucks. It is anticipated that the new apparatus bays would be built as a stand-alone building.
- D. Where possible, the project will incorporate mechanical energy saving strategies such as energy recovery ventilation systems, demand-controlled ventilation, and direct digital controls.

**1.2 GENERAL BUILDING DESCRIPTION**

- A. The existing Orono Public Works building is located adjacent to the Orono City Administration buildings in Orono, MN, in Hennepin County within ASHRAE Climate Zone 6A. The building is a single-level with a mechanical mezzanine located over the office and locker room spaces. Refer to the Architectural drawings and building plan for more information about the proposed floor plan and the specific locations for the offices, special-use areas and anticipated vehicle apparatus bay layout.

**1.3 GENERAL SYSTEMS DESCRIPTION**

- A. Air Handling Systems
  - 1. A review of the original design documents and a site verification visit indicate that the existing Orono Public Works facility is served by two direct gas-fired make-up air-handling units (MAUs) that serve the entirety of the vehicle parking areas, maintenance and repair area, wash bay and auxiliary shop areas. MAU-1 (18,000-cfm) serves the majority of the spaces, while MAU-2 (2,000-cfm) serves the existing maintenance area at the NE corner of the building (although the space is not physically isolated from the rest of the building).
  - 2. A separate gas-fired furnace (F-1) with 4-ton remote direct-expansion (DX) condensing unit provides ventilation, heating and cooling to the office spaces, lockers and lunch

## DTE MECHANICAL AND PLUMBING SCHEMATIC DESIGN NARRATIVE

Orono Public Works – Fire Station Transition & Navarre Fire Station Apparatus Bays

room. See attached Zone Map for more information about the existing HVAC systems and the spaces they serve.

B. Heating Systems

1. The existing parking, storage and maintenance areas are served by a combination of gas-fired radiant heating units (Co-Ray-Vac or similar) with auxiliary gas-fired unit heaters located at entrances.

C. Exhaust Systems

1. The existing exhaust systems are indicated on the Zone Map and serve the following systems:
  - a. EF-1 – Diesel exhaust (24,300-cfm)
  - b. EF-2 & -3 – Garage exhaust (9,000-cfm each)
  - c. EF-4 – Diesel exhaust (2,000-cfm)
  - d. EF-5 – Truck exhaust (1,000-cfm)
  - e. EF-6 – Toilet exhaust (210-cfm)
  - f. EF-7 – Welding exhaust (600-cfm)
2. The existing garage MAU units and EF-2, -3 & -4 are interlocked and connected with existing MAU controllers and carbon-monoxide control panels and sensors.
3. The remainder of the existing exhaust systems function for general ventilation of the spaces or are dedicated directly to either hose reel truck exhaust in the maintenance area, welding exhaust or toilet exhaust at the office spaces.
4. The existing exhaust systems currently provide appropriate ventilation and are interlocked with the make-up air-handling units to ensure that the code-required minimum 0.75-cfm/sf ventilation rate in the apparatus bays and maintenance areas are maintained. The existing Carbon-monoxide (CO) gas detection systems need to be evaluated and the system should be re-commissioned to ensure proper operation. Additional NO<sub>x</sub> gas detection may need to be added to meet code requirements.

D. General & Miscellaneous Ventilation Systems:

1. Existing restrooms, locker room, storage and janitorial room exhaust is routed to existing exhaust fans. Any modifications or replacements will be selected as direct-drive fans to minimize required maintenance.
2. The vehicle apparatus bays and wash bay will have dedicated exhaust fans.

E. Supplemental Cooling:

1. There are no large electrical rooms, server rooms, and other spaces containing significant heat generating equipment that are anticipated to require supplemental direct-expansion (DX) mini-split cooling systems.

### 1.4 CODES AND STANDARDS

- A. 2020 Minnesota Building Code.
- B. 2020 Minnesota Mechanical and Fuel Gas Code.
- C. 2020 Minnesota Plumbing Code
- D. 2020 Minnesota Fire Code.
- E. 2020 Minnesota Energy Code.



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Orono Public Works – Fire Station Transition & Navarre Fire Station Apparatus Bays

- F. ASHRAE Standard 62.1 – 2016.
- G. SMACNA – HVAC Duct Construction Standard – Metal and Flexible.
- H. Local Codes.
- I. ASTM Standards.
- J. ASME Standards.

### 1.5 INTERNAL LOADS

- A. Schedules:
  - 1. Occupancy and lighting schedules based on ASHRAE recommendations for office and maintenance facilities will be used in calculating heating, cooling, and ventilation loads for the building during the design development (DD) and construction document (CD) phases of the project. These values will be adjusted throughout design as assumptions are refined to accurately match the design parameters.
- B. Ventilation
  - 1. The ventilation requirements for the building will be calculated to comply with the current Mechanical Code and ASHRAE Standard 62.1 – 2016. Ventilation rates will be based on the floor areas and number of occupants in each space and will include ventilation effectiveness and efficiency factors per code.

### 1.6 OUTDOOR DESIGN CRITERIA

- A. Eden Prairie, MN (Flying Cloud Airport) Weather Data.
  - 1. Cooling Design Condition: 90.6°F db / 74.0°F mcwb (ASHRAE 0.4%)
  - 2. Evaporation Design Condition: 77.4°F wb / 87.2°F mcdb (ASHRAE 0.4%)
  - 3. Heating Design Condition: -10.6°F (ASHRAE 99.6%)

### 1.7 INDOOR DESIGN CRITERIA

- A. Summer:
  - 1. Office Area: 75°F / 50% Relative Humidity (RH).
  - 2. Vehicle Apparatus Bays and Wash Bay: No cooling or dehumidification provided. Anticipate ambient temperature and humidity +10-20°F / +20% RH
- B. Winter:
  - 1. Office Area: 70°F.
  - 2. Vehicle Apparatus Bays: 60°F
  - 3. Wash Bay: 60°F.

### 1.8 UTILITIES

- A. Domestic Water & Fire Protection:
  - 1. A combined 8" domestic water and fire protection service main is located at the south end of the Orono Public Works building. It is split as it enters the building into a 6" fire-protection main and a 2" domestic water service.



## DTE MECHANICAL AND PLUMBING SCHEMATIC DESIGN NARRATIVE

### Orono Public Works – Fire Station Transition & Navarre Fire Station Apparatus Bays

2. Extension from an existing 6" water service main is anticipated to serve the Navarre apparatus bay addition. Design for fire-protection of the new building will be by a certified FP designer under a performance specification.
- B. Storm Water:
1. The Orono Public Works building has storm roof drainage from the sloped roof to existing site drainage around the building.
    - a. No internal storm water piping is routed within the building.
  2. It is anticipated that the storm drainage at the new Navarre apparatus bay will also be from sloped roof to site drainage.
- C. Sanitary Sewer:
1. A 6" PVC sanitary sewer main is routed from the south end of the Orono Public Works building.
    - a. The sanitary sewer main exits the building just downstream from a flammable waste interceptor at the SE corner of the parking area that accepts drainage from all of the trench and floor drains serving vehicle maintenance, parking and wash bay.
  2. Extension of a new, anticipated 6" sanitary service from existing city sanitary sewer to the Navarre apparatus bay addition is expected.
- D. Natural Gas:
1. A 2", 2-psig natural gas service line enters the Orono Public Works building at the SW edge of the building. It serves all of the MAU units, unit heaters, radiant heating units and water heating in the building.
  2. Extension from the existing natural gas meter at the Navarre station is anticipated. Details of the existing gas service will need to be confirmed, as will the existing meter capacity and pressure.
- E. Electrical Service:
1. The electrical service is routed from the east side of the Orono Public Works building. An 800-Amp, 3-phase service is currently connected at the site.
  2. The existing service, capacity and location at the Navarre site will need to be verified.
- 1.9 GENERAL REQUIREMENTS
- A. Mechanical/plumbing contractor shall provide all labor, materials, and equipment necessary for complete and operation systems described in this narrative and/or shown on the plans unless indicated or noted elsewhere. It is the intent of these documents that all systems shall be complete and ready for operation.
  - B. Mechanical/plumbing contractor shall include all associated equipment, hangers, insulation, valves, access panels, and miscellaneous components required for fully functional systems.
  - C. Mechanical/plumbing contractor shall examine the site and understand all the conditions that may affect the work of this division before submitting bids. No subsequent allowances



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for time or money will be considered for any consequence due to a failure to examine site conditions.

- D. Mechanical/plumbing contractor shall retain and pay for all licenses required by the state and city. The mechanical contractor shall also be responsible for arrangement of required inspections and payment of all inspection fees.
- E. The Owner shall pay for all review and permit fees.
- F. All mechanical work shall comply with applicable national, state, and local codes; laws; ordinances; regulations; and/or franchise requirements. If contractors are aware of conflicts between plans or specifications and such codes or regulations, they shall be brought to the engineer's attention prior to commencing applicable work. If contractors knowingly perform work in violation of such codes or regulations, whether or not such violation is shown or specified, the contractor shall be held responsible for the correction of the violation at no additional charge.
- G. Code compliance is mandatory. Where work is shown to exceed minimum code requirements, comply with the design documents.
- H. Mechanical/plumbing contractor shall provide fittings, offsets, transitions, valves, and accessories to accommodate building architecture and structure.
- I. Mechanical/plumbing contractor shall maintain one set of clean working drawings at the job site and record as-built information for any change or modifications during construction.
- J. Mechanical/plumbing contractor shall be responsible for required digging, cutting, and patching incident to work of this division and make required repairs afterwards to satisfaction of engineer. Cut carefully to minimize repairs to existing work. Do not cut beams, columns, trusses, or any structural member.
- K. All ductwork and piping penetrating rated conditions shall be properly protected and fire caulked.
- L. Mechanical/plumbing contractor shall patch and repair walls, floors, ceilings and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown. Surface finishes shall exactly match existing finishes of same materials.

### PART 2 PLUMBING SYSTEMS

#### 2.1 PLUMBING DESIGN INTENT

- A. An existing natural-gas fired 250,000 Btu/hr water heater serves the Orono Public Works building and is located on the mechanical mezzanine to serve all domestic hot water requirements.
- B. A domestic hot water recirculation pump, domestic hot water recirculation piping is installed to maintain readily available domestic hot water to all plumbing fixtures.
- C. There is not an existing water softening system serving the water service at the Public Works building.
- D. The transition of the Public Works building to use as a Fire Station is not anticipated to require any plumbing changes at the building.
- E. The Navarre apparatus bay addition will be designed in accordance with the following:



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1. New domestic water piping shall be sized by assuming 50 psi at the incoming water service, limiting domestic hot water and recirculating hot water piping to 5 feet per minute velocity (if needed), and limiting domestic cold-water piping to 8 feet per minute velocity.
  2. Provide new thermostatic mixing valves where required by code.
  3. Provide domestic hot and cold-water piping to all plumbing fixtures requiring this service. Also provide backflow preventers where necessary or required by code.
  4. Provide sanitary waste and vent piping for all plumbing fixtures requiring this service.
  5. All exposed traps shall be insulated as required by code.
  6. Under floor sanitary sewer piping shall be of schedule 40 PVC construction. Above floor sanitary sewer piping shall be of no-hub cast iron construction as required by code, or schedule 40 PVC.
  7. Provide cleanouts in accordance with the requirements of the Plumbing Code. Cleanout locations shall be coordinated with and approved by the owner.
  8. Plumbing vents within 10-feet of exterior shall have 1-inch thick man-made mineral fiber insulation with vapor barrier, ASTM C547.
  9. Provide floor drains in all restrooms, janitor rooms, mechanical rooms and other areas subject to water spillage and as indicated on drawings.
  10. Provide a flammable waste interceptor downstream of all trench and floor drains exposed to vehicle storage and/or maintenance areas.
- F. Plumbing Fixtures.
1. No modifications to existing plumbing fixtures are anticipated at the Orono Public Works building.
  2. Plumbing fixtures for the Navarre apparatus bay addition will be designed to meet the following:
    - a. Water Closets shall be as follows:
      - 1) WC-1: ADA compliant, high efficiency, low consumption (1.28 GPF), wall-mounted flush valve, vitreous china, elongated bowl, siphon jetted, 1½-inch top spud, with bolt caps.
      - 2) All seats shall have elongated bowl, open front, white plastic, less cover, with stainless steel self-sustaining check hinge.
      - 3) Trim: Sensor operated. Hard-wired or battery to be determined.
    - b. Lavatories shall be as follows:
      - 1) L-1: ADA Compliant, wall-hung, vitreous china, with overflow, D-shaped bowl, self-draining back deck area, faucet ledge, concealed arm supports, sink with single faucet hole, less soap dispenser hole, color to be white.
      - 2) Trim: Single hole faucet, sensor activated, battery powered, (0.5 GPM), vandal proof non-aerating spray, perforated strainer.
      - 3) Provide hangers as required.



## DTE MECHANICAL AND PLUMBING SCHEMATIC DESIGN NARRATIVE

Orono Public Works – Fire Station Transition & Navarre Fire Station Apparatus Bays

- 4) Provide grid strainer on all restroom lavatories. Handicapped usage fixtures shall be provided where required. Hot and cold-water supply pipes and traps shall be insulated with “trap wrap” on all handicapped usage fixtures.
  - c. Drinking fountains shall be as follows:
    - 1) DF-1: Wall mounted, single unit, filtered water, vandal-resistant drinking fountain with bottle filling station. ADA compliant.
  - d. Exterior Hose Bibbs and Wall Hydrants shall be as follows:
    - 1) H-1: (Exterior) ASSE 1019 compliant freeze-less wall hydrant.
  - e. Emergency Fixtures will be installed as deemed appropriate to cover the apparatus bays. Each location will have an emergency eyewash and drench shower with separate mixing valve to provide tepid / tempered water from the domestic hot water and cold water distribution systems.
- G. Fire Protection System:
- 1. An existing wet-pipe fire sprinkler system is currently installed in the Orono Public Works building and office spaces. Any modifications to the systems will need to be designed by a fire-protection contractor to meet NFPA 13 requirements under a performance specification.
  - 2. The fire sprinkler contractor shall install the fire sprinkler system throughout the building to accommodate any changes to MEP systems, and to comply with all applicable codes. Provide new piping and heads as required.
  - 3. Fire suppression work shall be coordinated with all other trades.

### PART 3 HVAC SYSTEMS

#### 3.1 HVAC AIR SIDE SYSTEM DESIGN INTENT

- A. The existing Orono Public Works building air-handling and exhaust systems are very closely matched for a transition from public works operation to that of a fire station.
- 1. The existing MAUs (serving areas in orange and blue in the Zone Map) should be re-commissioned to establish that the appropriate capacities as originally designed are still intact. This specifically includes establishing that the carbon-monoxide (CO) gas-detection system, coupled with the appropriate sequences and interlocks between MAUs and EFs are operational and meet current codes. The addition of gas-detection for NO<sub>x</sub> may be required. The original design does appear to meet all minimum ventilation criteria for the space (whether used as a public works building or fire station).
  - 2. The existing furnace (F-1) and condensing unit serving the office areas (in Green) appear to be in operational condition. This system should also be re-commissioned to ensure that the original design capacities and intent are acceptable to new occupancy requirements.
  - 3. The auxiliary rooms (Yellow areas) associated with the public works building (Sign Shop, Workroom, Multi-Purpose Room, Parts and Storage) may require some added exhaust





## DTE MECHANICAL AND PLUMBING SCHEMATIC DESIGN NARRATIVE

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- or attention depending on the re-programming of the spaces into Fitness, Turnout Gear, Decontamination and SCBA Equipment spaces. They are currently served by MAU-1 and general exhaust but may require a secondary AHU, likely located on the mechanical mezzanine.
4. The existing heating systems (natural gas-fired radiant systems and UHs) also appear to be in good working condition.
  5. Additional specialized exhaust systems dedicated for the apparatus bays for individual vehicle exhaust may be considered.
- B. The new Navarre apparatus bay addition would be handled largely by the same or similar equipment that currently serves the Orono Public Works building:
1. New direct, gas-fired MAUs will serve the new apparatus bays.
  2. The vehicle apparatus bays will be equipped with gas monitoring systems and associated exhaust systems to ensure compliance with ventilation rates and safety considerations for vehicle storage, maintenance and service locations.
  3. Auxiliary gas-fired heating systems (natural gas-fired radiant systems and UHs) will be provided for general heating of the apparatus bays.
  4. Additional specialized exhaust systems dedicated for the apparatus bays for individual vehicle exhaust may also be considered.
- C. Each new HVAC system will be designed to ensure quality, high performance, serviceability, and energy savings. Air handlers and make-up air-handling units shall be manufactured by Daikin, Trane, York, Aaron or equal.
1. Units shall be electric heating or gas-fired.
  2. Where applicable, units shall have an energy recovery wheel or energy recovery plate.
  3. Unit shall have a single point power connection.
  4. Unit shall have full-size access doors.
- D. The return air will be ducted to the air handling unit return assembly. Unless noted otherwise, spaces above ceilings shall not be used as a return air plenum.
- E. Ductwork systems will be galvanized steel and constructed in accordance with SMACNA Standards. Exposed ductwork shall be round or oval.
- F. Ductwork will be insulated per current Minnesota Energy Code. Also, outside air and exhaust air ductwork within 10 feet of the building exterior shall be insulated and provided with vapor retarder jacket.
- G. Air inlets and outlets within the building spaces will include adjustable square diffusers, linear slot diffusers, single or double deflection supply registers, louvered face return/exhaust grilles, and eggcrate return/exhaust grilles. Air inlets and outlets will be sized for low velocities (500 – 700 FPM) to prevent excessive noise.



## DTE MECHANICAL AND PLUMBING SCHEMATIC DESIGN NARRATIVE

Orono Public Works – Fire Station Transition & Navarre Fire Station Apparatus Bays

- H. Fire dampers, smoke dampers, and combination fire/smoke dampers shall be provided where required by code at fire and smoke rated walls.

### 3.2 ENERGY MANAGEMENT SYSTEM

- A. The existing building's stand-alone temperature control systems are anticipated to be used for all new equipment and HVAC components.
- B. All digital controls system shall be BACNet compatible.
- C. Systems shall be web based and accessible via the internet on a smart phone or tablet where applicable.
- D. Each HVAC zone shall have its own digital temperature sensor with setpoint adjustment. Each common area space shall have its own digital flat plate temperature sensor.
- E. See attached HVAC plan for additional information about intended systems and temperature control.

END OF MECHANICAL & PLUMBING SD NARRATIVE



**Orono Public Works Fire Station & Navarre Fire Station Addition**

**Schematic Design Narrative of Electrical Systems**

**October 2, 2023**

**DTE Project No. 09623003**

**Introduction**

1. This SD Narrative is to assist in the design scope for the City of Orono for the temporary Fire Station in the existing public works building and adding an apparatus bay to the Navarre Fire Station.
2. The existing building will have apparatus bay spaces for six fire vehicles, three command or medical vehicles and storage for trailers and boats. The existing office and auxiliary spaces will be modified as needed to suit the needs of the temporary fire station.
3. The Navarre Fire Station addition will be a stand alone building with bays to store up to four vehicles.

**Power Distribution:**

1. Service:
  - a. The existing 800A 480V service for the public works building will remain. Any damaged or faulty panels will be replaced.
  - b. The new addition for the Navarre Fire Station will have a new service fed from the existing transformer on site. This will be a 600A Service. The existing transformer will need to be inspected to ensure there are available taps for the new service.
  - c. Aluminum or copper conductors will be acceptable.
2. Equipment:
  - a. The existing panels in the public works building will be used to provide power to any new equipment that will be added while providing power to existing circuits.
  - b. The Distribution panel for the Navarre Fire Station will be located on the outside of the building in a NEMA 3R enclosure.
  - c. New 480/277V and 208/120V Panels will be provided for lighting, power, and equipment loads.
  - d. All new panelboards shall have a non-branch mounted main breaker, copper or aluminum busing, 100% rated neutral, plug-on breakers and a minimum of 42 circuits.
  - e. Breakers rated over 250A shall be 100% rated.
  - f. ARC fault rated breakers will be used throughout as required per the latest edition of the NEC.
3. Emergency Power:
  - a. A 480Y/277 V, 3-phase generator Diesel Generator will be provided for back-up emergency power. This generator will be located near the building within a Weatherproof Sound Enclosure
  - b. Automatic Transfer Switch will be provided emergency power to life safety equipment, and owner proposed equipment.
4. HVAC/Plumbing:
  - a. Power distribution to motor starters, SSRV starters, and VFD's for the new mechanical equipment will be coordinated with Mechanical. For the existing public works building and Navarre Fire Station addition.

**Grounding Systems:**

1. Existing ground systems will be inspected to insure that system is intact and code compliant.
2. The Navarre facility grounding system will consist of earth electrode ground rods and grounding electrode conductor. The earth electrode ground rod will be ¾ inch by 10 feet, copper or copper-clad steel. The top of the vertically driven ground rod will be a minimum of 12 inches below grade. The grounding electrode conductor will be bonded to the earth electrode ground rod with an exothermic welded joint or clamp. The electrical service system neutral will be grounded at service entrance equipment to building metal water piping, structural steel, and telecommunications system welded joint or clamp. The electrical service system neutral will be grounded at service entrance equipment to building metal water piping, structural steel, and telecommunications system.
3. Service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway system, cable tray, equipment- rounding conductor in all feeders and branch circuits and receptacle grounding connectors will be bonded.
4. Equipment grounding conductor will be a green insulated copper conductor unless otherwise indicated. There will be no interconnection between equipment grounding conductors and neutral conductors except at the main service grounding point. All connections to equipment to be grounded will be made with a grounding connector specifically intended for that purpose.
5. Bare wire, wrapped around mounting bolts and screws, is not acceptable as a grounding connection. All ground lugs will be of a non-corrosive material suitable for use as a grounding connection, and must be compatible with the type of metal being grounded. All mating surfaces and connections will be between cleaned bare metal to bare metal surfaces.

**Receptacles:**

1. Calculated receptacle loads will be loaded no more than 80% of the circuit breaker rating.
2. Existing rooms such as the offices shall remain as is.
3. Receptacles will be provided in all areas according to NEC standards, with special consideration for the following locations.
  - a. All Office spaces shall have a receptacle located on every wall.
  - b. Power will be provided for all motorized doors and gates for the project.
4. Power will be provided for all equipment needed within remodeled spaces to meet needs of owner.

**Lighting:**

1. Calculated lighting loads will be loaded no more than 80% of the circuit breaker rating.
2. Indoor lighting circuits will be rated 277V/1Phase. Outdoor circuits will be rated 277V/1Phase. For public works building. Lighting for Navarre Fire Station will be 120V/1Phase indoor and outdoor.
3. New luminaires are to be used. General requirement for new luminaires will be:
  - a. CRI rating of 80 or higher.
  - b. Color Temperature of 4000k
  - c. Rated life span of 50,000 hours or greater.
4. Exterior lighting will be provided for parking lots and drives on the properties.



5. Proposed Lighting Controls:

- a. Exterior fixtures serving area site lighting will be controlled via a photocell and motion sensor integral to the fixture.
- b. A vacancy sensor with manual switch will be provided in every office space.
- c. Dimming controls will be provided in offices, lobby, kitchen, multi-purpose, conference, and any other common areas.
- d. Restrooms and locker room will be controlled via occupancy sensors.
- e. Mechanical, Electrical, and other utility spaces will be controlled via manual controls.
- f. Storage rooms, Janitor, work rooms, open office spaces will be controlled via vacancy sensors and manual controls.
- g. Energy Code Requirement: Spaces which contain more than 2 fixtures and has windows or skylights shall be provided with day light harvesting controls to control the luminaires closest to the windows or skylights.
- h. Existing lighting in Public Works building shall remain where it is LED fixtures. All other fixtures will be removed and replaced.

**Life Safety:**

1. LED exit signs shall be provided throughout to identify the paths of emergency egress.
2. Emergency egress lighting shall be provided in common spaces to illuminate the path of egress in the event of a power outage. Emergency fixtures will be powered through stand-by emergency generator.
3. A fire alarm control panel will be located in the electrical room. A remote annunciator will be located in the main entry.
4. Fire alarm design shall follow Orono City Standards.

**Conduit:**

1. EMT conduit will be used indoors.
2. PVC schedule 40 conduit is to be used outdoors and underground.
3. Liquid tight or flexible metal conduit may be used where a rigid conduit connection to equipment is not practical.
4. MC cable may be used as fixture whips from a rigid conduit system. MC cable will be used for fixture whips not to exceed 6' in length. MC cable will not be allowed to be ran concealed in walls.

**Wire:**

1. All wire smaller than 1/0 shall be copper.
2. All wire 1/0 or larger may be copper or aluminum.
3. Energy Code Requirement:
  - a. All branch circuit conductors shall be sized so that the voltage drop from the point of service does not exceed 3%.

**Conductors:**

Type AC, NM, UF, USE, and SE cable may be used as allowed by the NEC and the authority having jurisdiction (AHJ). Contractor shall be responsible for coordinating these requirements with the AHJ before installation of such materials.



**Disconnects:**

1. Provide UL listed, heavy duty, 600 volts, 3-pole safety switches for all HVAC and plumbing motors/equipment.

**Wiring Devices:**

1. All devices to match existing faceplates.
2. Devices to be white in color for normal power, red in color for generator power.
3. Tamper proof receptacles are to be provided in common spaces.
4. Switching devices to be white in color for normal power, red in color for generator power.
5. Vacancy and Occupancy sensors shall be of the dual technology type.
6. Ceiling mounted sensors shall be provided with an extra contact for control of HVAC systems in each space.
7. Floor boxes shall be installed in conference rooms where required. Covers shall not have any component, hinged piece or flap which extends upward while cords are plugged into the devices housed by the floor box.

**Voice/Data:**

1. Electrical Contractor to provide all rough-in boxes and conduit for technology devices.
2. Electrical Contractor to provide all voice/data cabling, wall jacks and terminations to wall jacks and an owner provided patch panel. Owner will provide head-end equipment, racks, and cables at head end equipment.
3. Owner will provide technology cabling, jacks, and head end equipment.
4. Owner will install a wireless access system in the building. Owner to provide proposed locations of access points for contractor to cable.

**Security:**

1. Electrical Contractor to provide all rough-in boxes and conduit for security devices.
2. Owner will provide security cabling, devices, and head end control equipment.
3. Electrical contractor will provide 120V power to door access systems and control panel.

**Codes and Standards:**

1. 2020 National Electrical Code
2. 2018 International Energy Conservation Code
3. 2020 Minnesota Building Code
4. 2020 Minnesota Fire Code
5. 2020 Minnesota Energy Code
6. Local Codes and Authority Having Jurisdiction

End of Narrative





City of Orono  
Fire Department  
Renovation

ORONO, MN.

DATE: 23-26

DATE: SEPTEMBER 22, 2023

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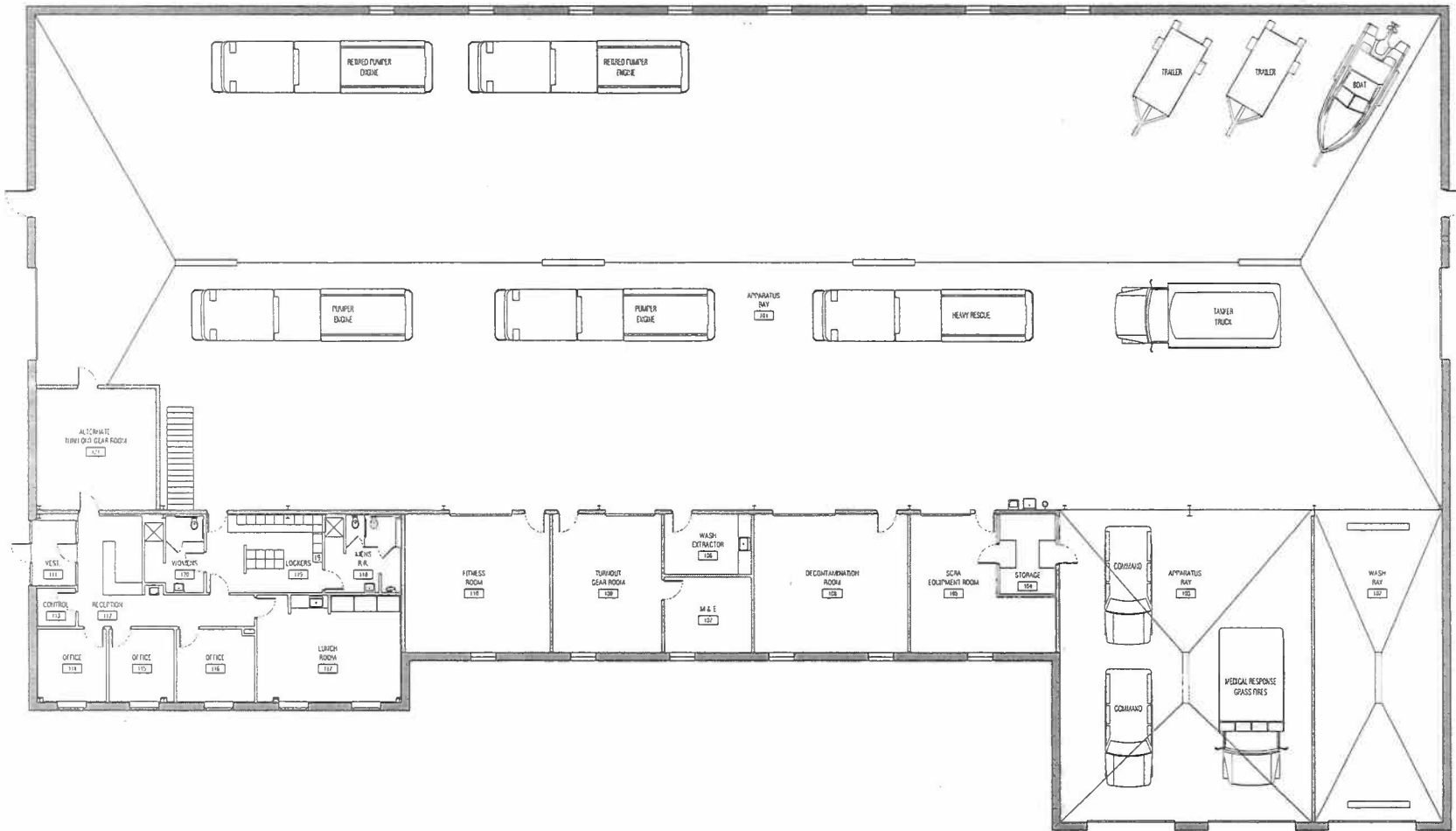
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0' 4' 8' 16'  
SCALE

1 BUILDING PLAN

1/8" = 1'-0"



BUILDING PLAN

A-101



DESIGN TREE ENGINEERING

MECHANICAL & PLUMBING SCHEMATIC DESIGN - ZONE MAP

City of Orono  
Fire Department  
Renovation

ORONO, MN.

PROJECT NUMBER 23-75

DATE: SEPTEMBER 22, 2023

DESIGNER: EMW

DATE: 09/22/23

BY: EMW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED ARCHITECT IN THE STATE OF MINNESOTA.

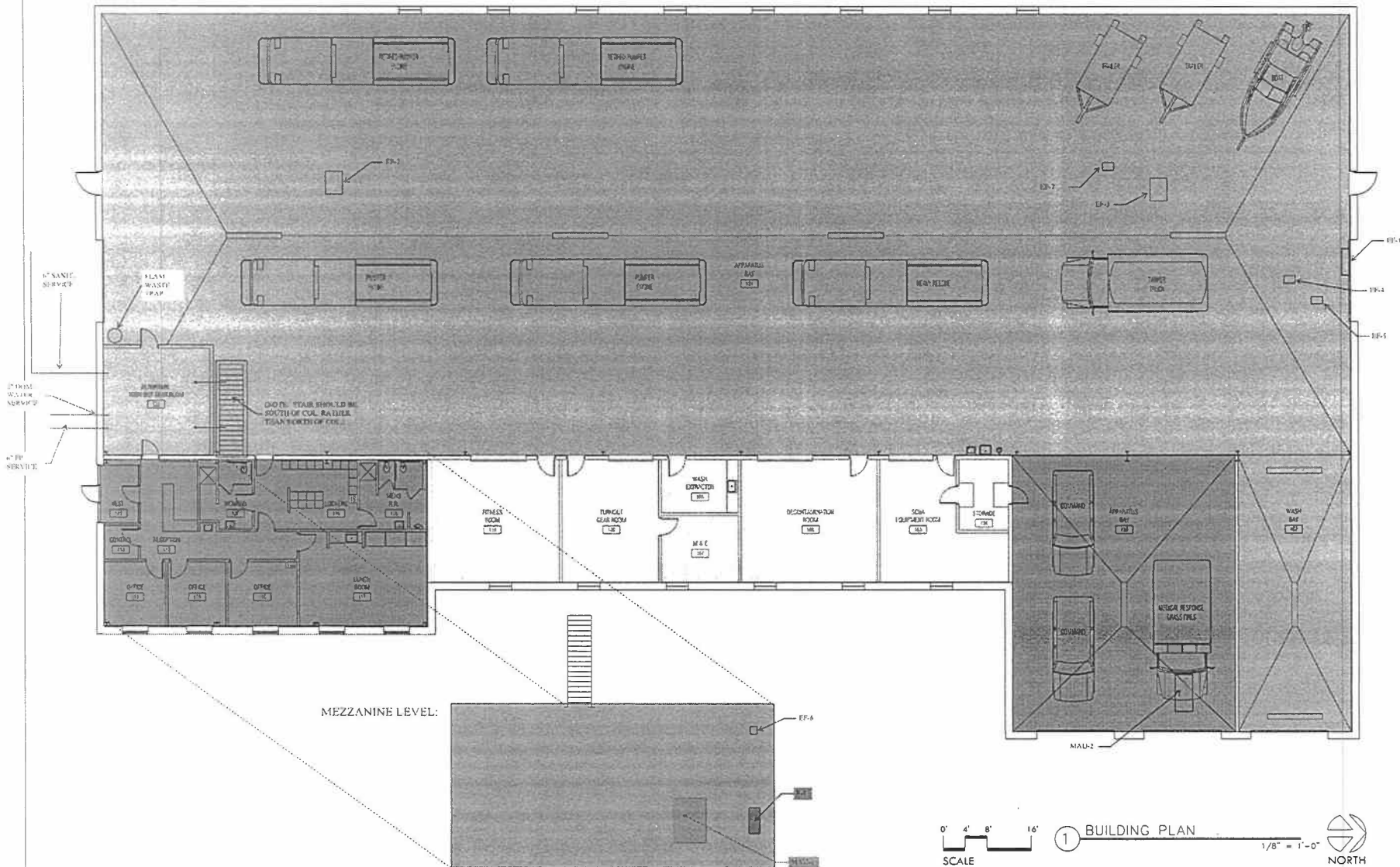
DATE: 09/22/23

BY: EMW

DATE: 09/22/23

**BUILDING PLAN**

A-100



0' 4' 8' 16' **1 BUILDING PLAN** 1/8" = 1'-0" **NORTH**  
SCALE